

Application Serial No. 10/653,308
Reply to Office Action of July 26, 2005

PATENT
Docket: CU-3344

REMARKS

In the Office Action, dated July 26, 2005, the Examiner states that Claims 1-28 are pending and Claims 1-28 are rejected. By the present Amendment, Applicant amends the claims.

The Applicant has cancelled the original claims and introduced new claims. The rejections in the Office Action are hereby traversed with respect to the new claims.

The main aims of the present invention are to provide a handpiece that combines the functions of the straight and angle handpieces, with minimization of the handpiece part arranged in the patient's mouth cavity, and that also allow treatment of carious cavities positioned both inside of the distal end of the patient's mouth cavity and outside of the oral end of the jaw, that is, achievement of the possibility to treat any carious cavities of the patient with the same handpiece at minimization of dimensions of the handpiece part that is arranged in the patient's mouth cavity. None of the cited references allow achievement of said aims. The Applicant submits new claims taking into account said assertions and based on the set of claims, specification and drawings of the invention.

In the Office Action, previous Claims 17 and 18 were rejected under 35 U.S.C. 102 §(b) as being anticipated by RU 2,030,904 (Rogovsky). Claims 1-5, 7, 8, 10-15 and 26-28 were rejected under 35 U.S.C. 103 §(a) as being unpatentable over RU 2,030,904. Claims 6, 9 and 16 were rejected under 35 U.S.C. 103 §(a) as being unpatentable over RU 2,030,904 in view of RU 96,101,748. Claim 19 was rejected under 35 U.S.C. §103(a) as being unpatentable over RU 2,030,904 in view of US 5,052,924. Claims 20-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over RU 2,030,904 in view of US 5,476,380.

RU Patent 2,030,904 [1] relates to an angled handpiece wherein a longitudinal axis of a head is significantly displaced relatively to a longitudinal axis of a body of the handpiece and lies in a plane essentially parallel to the latter axis. The head of the handpiece [1] is essentially cylindrical and turnable in a plane essentially parallel to the longitudinal axis of the handpiece. The dental instrument mounted in the head may be turned only in a sagittal plane essentially parallel to the longitudinal axis of the handpiece, and a longitudinal axis of the instrument at any turn lies in a plane essentially parallel to a longitudinal axis of the handpiece body and cannot be

Application Serial No. 10/653,308
Reply to Office Action of July 26, 2005

PATENT
Docket: CU-3344

displaced from the latter axis. Such a structural embodiment makes this handpiece unable to treat carious cavities positioned both inside of the distal end of the jaw tongue side and outside of the distal end of the jaw cheek of the patient's mouth cavity, because it is possible only when a cavity where the longitudinal axis of the instrument, mounted in the head lies can be positioned at an angle to the longitudinal axis of the handpiece body, that is, displaced from the latter axis as in the claimed invention. There are no technical means to implement the present arrangement of the instrument in an embodiment of the handpiece protected by said document [1].

It is also impossible to implement a position in this handpiece [1] wherein the longitudinal axis of the instrument coincides with the longitudinal axis of the handpiece.

Further, the present handpiece [1] has a bend with the cylindrical head mounted thereon, and presence of said bend significantly increases the dimensions of a part of the handpiece that should be positioned within the patient's mouth cavity in operation, which results in the patient's inconvenience when exploiting this handpiece.

The body of the handpiece [1] has a turning sleeve arranged therein and a channel (7) for feeding air to a turbine, said channel being formed along a neck of the sleeve and being not annular or spiral in an outer lateral surface of the head. At the same time, the handpiece head has its own body that has no intermediate channel for feeding the air stream to the turbine. Absence of such channel in the head results in reducing the turbine operation power during operation at change in a position of the instrument, which gives no possibility to apply a normal pressure (2.5 to 3.5 atm) to the turbine. With said structural embodiment of the head, it is technically meaningless to make at least one annular or spiral intermediate channel in the outer lateral surface of the head, because change in a position of the instrument is possible only in the sagittal plane essentially parallel to the longitudinal axis of the handpiece body, which excludes the necessity to have said channels.

In the claimed invention (US Application No. 10/653,308 hereinafter referred to as [2]), disclosure is provided for a technical solution in a form of essentially straight handpiece whose structural embodiment makes it possible to create a counter-angle of a dental instrument position that provides for a possibility of treating

Application Serial No. 10/653,308
Reply to Office Action of July 26, 2005

PATENT
Docket: CU-3344

carious cavities positioned both inside of the distal end of the jaw tongue side and outside of the distal end of the jaw cheek of the patient's mouth cavity.

A first end of the handpiece body in the claimed invention [2] is formed as a cup that forms a seat oriented so that a longitudinal axis of said cup lies in a plane not parallel to the longitudinal axis of the handpiece body but slightly deflected from the longitudinal axis of said body. At the same time, the cup as such does not protrude beyond the overall dimensions of the handpiece body.

The handpiece head is made essentially in a form of a sphere and has a first part designed for positioning the dental instrument and a second part positioned in the seat to provide variation of an angle between a plane in which the longitudinal axis of the dental instrument lies and the longitudinal axis of the handpiece body. The head is mounted in the seat to be capable of making a full turn around an axis of rotation relative to the seat. At the same time, the rotation axis of the head coincides with the longitudinal axis of the seat.

The head is fastened in the seat to eliminate the lateral displacement of the head relative to the longitudinal axis of the dental instrument at any turn of the head and any position of the handpiece body.

Said aspects of the disclosed handpiece are described in the specification and are illustrated in the accompanying drawings.

These claimed aspects of the disclosed handpiece allow combination of functions of the straight and angle handpiece in one handpiece at minimization of dimensions of the handpiece part that is in the patient's mouth cavity, and allow this handpiece to treat carious cavities positioned both inside of the distal end of the jaw tongue side and outside of the distal end of the jaw cheek side.

Such an embodiment of the first end of the handpiece body with the spherical head makes it necessary to have at least one intermediate air feed channel that connects a channel designed to supply the air stream to the head and arranged in the handpiece body to at least one nozzle for feeding the air stream directly to the turbine at any position of said head at its full turn. With this, said at least one intermediate channel should be annular or spiral in the inner lateral surface of the seat or in the outer lateral surface of the head part positioned in said seat to provide said connection of the channel designed to supply air to the head and arranged in

Application Serial No. 10/653,308
Reply to Office Action of July 26, 2005

PATENT
Docket: CU-3344

the handpiece body to at least one nozzle for feeding air directly to the turbine at any position of said head during its full turn.

Presence of such channel and its embodiment mentioned above make it possible to apply a normal pressure (2.5 to 3.5 atm) to the turbine, and to provide undisturbed operation of the handpiece turbine at any positioning of the instrument and at any complexity and duration of treating a carious cavity.

The prior art handpiece [1] has one solid light guide that is made with a connector along a head-to-body joining axis. Presence of the connector reduces friction of joined parts of the light guide at possible turning of the head by the instrument. With the present structure of the handpiece, however, complete exclusion of friction at the place where parts of the light guide contact each other seems impossible. This results in abrasion of the contact surfaces of the light guide and illumination disturbance in operation of the handpiece.

The claimed invention [2] has at least two different light guides, the first light guide being positioned in the handpiece body, and the second light guide being positioned in the handpiece head and having an inlet arranged with a gap relative to said outlet of said first light guide, which defines a space as shown in FIG. 4. With this, locations of an outlet of the first light guide and an inlet of the second light guide are selected to provide sufficient light transmission from the first light guide to the second light guide at any turn of the head in the seat. At the same time, dimensions of said guide lights can be different and said light guides can be positioned with their inlets-outlets only partially opposite to each other at any position of the head being turned.

A connector between two contacted parts of light guide according to [1] is replaced by a gap defining a space between the outlet of first light guide and the inlet of second light guide. With such a structural embodiment, there is no contact between two light guides, which excludes friction between said light guides and provides their undisturbed operation for a long time.

Furthermore, as shown in FIG. 4, said second light guide of the head is divided into two light guides both having an outlet positioned in the vicinity of said dental instrument.

Application Serial No. 10/653,308
Reply to Office Action of July 26, 2005

PATENT
Docket: CU-3344

The Applicant further disagrees with the rejection that use of the micromotor in a claimed way is apparent from the US Patent 5,476,380 [4] and RU Patent 2,030,904 [1] taken together.

The headpiece [1] has no motor as such and its presence is provided in neither the claims nor the specification concerning with the handpiece [1].

The rejection's assertion that use of the motor according to [4] in said handpiece [1] is apparent for the person ordinary skilled in the art is not true, because use of the motor according to [4] as a drive in [1] requires modernization of the handpiece [1] structure in a manner provided in neither claims nor specification of [1].

Further, use of the motor in [4] is designed to rotate the dental instrument. Contrary to this, use of the micromotor in the invention [2] is designed to turn the head and change the position of the instrument when the head is both within and outside of the patient's mouth cavity. At the same time, air being fed to the micromotor for turning the head and changing the position of the instrument is used to activate the turbine in order to rotate the dental instrument.

All these aspects are described in the specification of the claimed invention [2].

Furthermore, it follows from both the claims and the specification of [4] that the structural embodiment of the motor according to [4] is very complicated and significantly differs from that claimed by the Applicant in [2].

US Patent 4,281,989 [3] relates to a dental handpiece that in one embodiment is a straight handpiece wherein a longitudinal axis of a dental instrument coincides with a longitudinal axis of a body (handle) of the handpiece. This handpiece [3] has an arm with a turning motion freedom, and change in a position of said arm allows transformation of this handpiece into an angular one. At the same time, a head of the handpiece is cylindrical and is fastened with its end faces at one end of the arm whose other end is fastened on the handpiece body. At any position of the arm and the head with the dental instrument, a plane in which the longitudinal axis of the dental instrument lies is parallel to the longitudinal axis of the handpiece body, and structural aspects of the handpiece [3] exclude the possibility to deflect this plane from the longitudinal axis of the handpiece body.

Application Serial No. 10/653,308
Reply to Office Action of July 26, 2005

PATENT
Docket: CU-3344

By changing a position of the arm within limits provided by its turning motion freedom, it is possible to obtain a counter-angle of arrangement of the instrument. However, significant lateral displacement of the head relative to the longitudinal axis of the handpiece body will take place here, and the handpiece will gain larger overall dimensions in a part that is arranged in the patient's mouth cavity. Further, screws that present to connect parts of the arm result in that the head becomes non-capable of making a full turn for 360 degrees.

Furthermore, presence of the arm significantly complicates the structure of the handpiece and does not allow minimization of dimensions in the handpiece part that is arranged in the patient's mouth cavity.

The above-mentioned embodiment of the claimed handpiece [2] makes it possible to exclude the lateral displacement of the head relative to the longitudinal axis of the handpiece body at any turn of the spherical head and any position of the dental instrument, and to minimize the dimensions of the handpiece part that is arranged in the patient's mouth cavity.

The Applicant can agree with the Examiner's opinion that the handpiece [3] has intermediate channels for feeding air to the turbine. However, said channels are formed in the end face of the head and have a form of trays, so this makes the head unable to make a full turn around its axis of rotation, because creation of a counter-angle for arrangement of the instrument will not be accompanied with feeding the air stream to the turbine. With such a structural embodiment of the head, it seems impossible to form said intermediate channels to be annular or spiral in the outer surface of the head, because the connection of said intermediate channels to the air stream feed channel arranged in the arm and the handpiece body will not be achieved in such a case.

The annular or spiral arrangement of intermediate channels in the outer surface of the head or in the inner surface of the seat makes it possible to provide undisturbed feed of the air stream at any position of the instrument in the claimed handpiece [2].

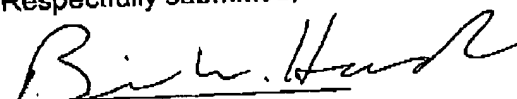
Previous Claims 1-9, 16, 27 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over US 4,281,989 (Glover et al.).

Application Serial No. 10/653,308
Reply to Office Action of July 26, 2005

PATENT
Docket: CU-3344

In light of the foregoing response, all the outstanding objections and rejections are considered overcome. Applicant respectfully submits that this application should now be in condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,



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